Site-Wide Soil and Waste Management Plan Boeing Realty Corporation Former C-6 Facility Torrance, California

Prepared for

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Prepared by

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Project No. 322781000

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November 9, 2000

Mr. Brian Mossman
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3760 Kilroy Airport Way
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Long Beach, California 90806

Subject: **Soil and Waste Management Plan**
Former C-6 Facility - Torrance, California

Dear Mr. Mossman:

Ogden Environmental and Energy Services Co., Inc. (Ogden) is submitting the enclosed Soil and Waste Management Plan (SWMP) for the above-referenced site. Ogden has prepared the SWMP to assist in the planning and management of soil and waste generated during site demolition and redevelopment.

If you have any questions or want to discuss the contents of this SWMP, please feel free to contact me at (858) 458-9044.

Sincerely,
Ogden Environmental and Energy Services Co., Inc.

Scott P. Zachary
Project Manager

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LIST OF ACRONYMS AND ABBREVIATIONS

ALCOA	Aluminum Company of America
AOC	area of concern
bgs	below ground surface
BRC	Boeing Realty Company
CCR	California Code of Regulations
Cr(VI)	hexavalent chromium
CSC	Columbia Steel Company
DAC	Douglas Aircraft Company
DOT	Department of Transportation
DPC	Defense Plant Corporation
EIA	environmental investigation area
ESA	environmental site assessment
HASP	Health and Safety Plan
IDW	investigation-derived waste
lb/ft^3	pounds per cubic foot
LTTO	low temperature thermal oxidation
mmHg	millimeters of mercury
Ogden	Ogden Environmental and Energy Services Co., Inc.
OVA	organic vapor analyzer
PCB	polychlorinated biphenyl
POL	petroleum-based products, oils, and lubricants
PPE	personal protective equipment
ppm	parts per million
PVC	polyvinyl chloride
RAWP	Risk Assessment Work Plan
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
SCAQMD	South Coast Air Quality Management District
SWMP	Soil and Waste Management Plan
UN	United Nations
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VGAC	vapor-phase granular activated carbon
VOC	volatile organic compound

SECTION 1
INTRODUCTION

Boeing Realty Company (BRC) is demolishing and redeveloping the former C-6 aircraft manufacturing facility in Torrance, California. BRC has retained Ogden Environmental and Energy Services Co., Inc. (Ogden) to prepare this plan to assist ongoing soil investigation and demolition activities. The pre- and postdemolition soil investigations will generate potentially impacted soil cuttings and other so-called investigation-derived wastes (IDWs). Localized areas of soil impacts that could impede or prevent redevelopment may subsequently be removed or remediated after the surface structures and paving have been removed. These postdemolition soil remediation activities could also result in the removal of larger quantities of impacted soil. This Soil and Waste Management Plan (SWMP) presents procedures for handling, profiling, and disposing of or recycling excavated soil and soil cuttings, and other IDW generated during investigation and remediation of the former C-6 Facility (Facility).

It is anticipated that contractors other than Ogden may also use this SWMP to manage wastes such as groundwater generated during monitoring well development water or aquifer pumping tests; therefore, wastes associated with these activities are also discussed in this document.

1.1 BACKGROUND INFORMATION

The Facility is located at 19503 South Normandie Avenue in Torrance, California (Figure 1). The Facility is divided into four parcels: A, B, C and D (Figure 2). This SWMP has been prepared for Parcel C. Parcel C consists of Buildings 1, 2, 3, 19, 20, 32, and 66, which are partiality or completely demolished. Parcels A, B, and D have already been investigated and are currently being developed.

The Facility was farmland prior to the 1940s. Defense Plant Corporation (DPC) first developed the Facility in 1941 as part of an aluminum reduction plant. The Aluminum Company of America (ALCOA) operated the plant until late 1944. From 1944 until 1948, the site was used for warehousing by the War Assets Administration. In 1948, the Columbia Steel Company (CSC) acquired the property. In 1952, the U.S. Navy purchased the property from CSC and established Douglas Aircraft Company (DAC) as the contractor and operator of the Facility for the manufacture of aircraft and aircraft parts. DAC purchased the Facility from the Navy in 1970 and continued manufacturing aircraft components until 1992. BRC acquired the Facility in 1996 when it purchased McDonnell Douglas Corporation.

Most manufacturing operations at the Facility have been inactive for approximately 8 years. The manufacturing equipment has been removed from the Facility, although a limited amount of assembly and activities related to warehousing continued through mid-2000. Currently, the Facility is closed and the buildings are either partially or completely demolished.

A wide variety of chemicals and blended products have been used at the Facility over the last 60 years. These include aviation fuels; other petroleum-based products, oils, and lubricants (POLs); chlorinated and aromatic volatile organic compounds (VOCs); adhesives; sealants; mineral acids; caustic solutions; and other inorganic chemicals associated with metal plating and various types of pesticides. Some of these compounds have been accidentally released over the years and have impacted vadose zone soils and, in some locations, the underlying groundwater. Examples of other impact sources are underground storage tanks (USTs), fuel distribution lines, sumps, and other "wet" process areas. BRC is currently investigating and, where necessary, remediating these releases as they are identified.

Subsurface investigations have shown that the Facility is underlain by a heterogeneous mix of primarily clays, silts, and fine-grained silty sands. Groundwater is typically encountered at about 60 to 70 feet below ground surface (bgs).

After removing the existing surface structures and pavement, BRC plans to install new surface and subsurface infrastructure (streets, sewers, storm drains, and utilities) as needed to sell, redevelop, or lease the lots. The overall goal is to create a new, community-oriented, mixed use commercial/retail complex.

1.2 Site Investigation

In 1996, BRC retained Kennedy/Jenks Consultants of Long Beach, California, to conduct a Phase I Environmental Site Assessment (ESA) for Parcel C. The Kennedy/Jenks Phase I ESA identified numerous features within the Facility as potential sources of soil impacts.

Investigative techniques include direct-push and hollow-stem auger drilling methods to collect soil samples for chemical analysis.

Concurrent with the Phase II soil investigation, other BRC contractors will conduct a groundwater quality investigation and remediate areas of known groundwater impacts. The groundwater investigation and remediation programs are expected to include drilling and installation of monitoring and extraction wells. Activities related to the soil and groundwater investigation/remediation programs are expected to include:

- asphalt or concrete coring
- subsurface utility clearance
- direct-push or hollow-stem auger drilling/soil sampling
- groundwater monitoring and extraction well installation, development, and sampling
- limited soil removal
- equipment decontamination
- aquifer pumping tests
- handling of used personal protective equipment (PPE) and management of other IDW

Soil cuttings, wastewater, and other IDW derived from the above-listed activities could contain any of the many chemicals used by BRC and its predecessors at the Facility.

The soil investigation is being performed in accordance with the following documents prepared by BRC contractors:

- Site-wide Health and Safety Plan (HASP)
- Environmental Investigation Area (EIA)-specific Sampling and Analysis Plans (SAPs)
- Site-wide Risk Assessment Work Plan (RAWP)

These documents are cited, as appropriate, throughout this SWMP and should be referred to for specific information regarding the Phase II soil investigation.

1.3 ANTICIPATED REMEDIATION ACTIONS

It is likely that the Phase II soil investigation will identify localized near-surface, vadose zone soil impacts. Therefore, BRC's redevelopment plans include provisions for removal or remediation of near-surface soil impacts that may impede or preclude redevelopment. In this context, BRC has differentiated between near-surface soil impacts and deeper soil and/or groundwater impacts.

For the purpose of the Facility redevelopment program, "near-surface" is considered to be the upper 12 feet of the soil profile, as this is the maximum anticipated depth for subsurface utility and foundation excavations. It is anticipated that soil impacts within the upper 12 feet can be removed or remediated in the short term prior to redevelopment. BRC anticipates that longer-term environmental issues will be accommodated in the redevelopment plans such that wells, subsurface piping, and other remedial facilities can be installed when the facility is redeveloped. Thus, longer-term remediation efforts may continue unobtrusively during and after redevelopment. Based on this distinction, the Phase II soil investigation will focus primarily on the upper 12 feet of the soil profile.

Potentially hazardous constituents likely to be encountered in the subsurface include aviation fuel; POLs; aromatic and chlorinated VOCs; and metals, including hexavalent chromium (Cr[VI]). Quantities of impacted soil will vary according to site-specific conditions. Potentially hazardous constituents and impacted soil volumes will be assessed during the Phase II soil investigation.

1.4 REGULATORY AGENCY REQUIREMENTS

Handling, storage, transportation, and disposal of impacted soil and other IDW are subject to federal, state, and local regulations. The principal governing factor is whether the waste is hazardous or nonhazardous. A description of the waste characterization process is provided in the U.S. Environmental Protection Agency (USEPA) document entitled *Hazardous Waste Identification*, a copy of which is included as Appendix A of this SWMP. Briefly, the four characteristics, any one of which may characterize a waste as hazardous, are:

- **Ignitability.** Ignitable wastes are wastes that can readily catch fire and sustain combustion.

- **Corrosivity.** Corrosive wastes are acidic or alkaline (basic) wastes that can readily burn flesh, or corrode or dissolve metal or other materials.

- **Reactivity.** Reactive wastes readily explode or undergo violent reactions when exposed to air, water, or occasionally under normal handling conditions.

- **Toxicity.** Toxic wastes may be considered environmentally toxic, persistent, or bioaccumulative, or may potentially leach "dangerous" concentrations of certain toxic chemicals into groundwater if disposed of in a solid waste landfill.

In general terms, it is somewhat unusual to encounter impacted subsurface soil that is corrosive or reactive because native soils tend to neutralize or buffer these characteristics. Soils containing aviation or other fuels could conceivably be ignitable. However, this is, again, atypical, since a solid may be considered ignitable if it "is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture, or spontaneous chemical changes, and, when ignited, burns so vigorously and persistently that it creates a hazard." Depending on the type(s) and concentration(s) of potentially hazardous constituents present, certain soils could be considered toxic. Determination of toxicity can only be made on a case-specific basis; accordingly, no attempt is made herein to project types or quantities of potentially toxic wastes that may be generated during the subject Phase II soil investigation activities.

In addition to the four criteria listed above, USEPA considers certain types of waste material hazardous based on the processes that generated them. Examples include certain wood preserving and petroleum refinery wastes. These wastes are commonly known as "listed wastes."

Hazardous wastes may only be temporarily stored at a facility for 90 days, unless the wastes are being accumulated pursuant to California Code of Regulations (CCR) Title 22 Section 66262.34, or the facility has a storage variance or is permitted to store wastes for longer periods, as indicated in its Resource Conservation and Recovery Act (RCRA) Part B Permit. In many cases, it may take weeks to obtain and evaluate the laboratory test results necessary to characterize a waste as hazardous. In such instances, the 90-day storage period does not begin until the hazardous waste classification is established.

Regardless of whether a waste is hazardous or nonhazardous, records must be maintained regarding its transportation and ultimate disposition. For hazardous wastes, a Hazardous Waste Manifest must be completed. The manifest describes the waste and/or includes the listed waste control number and identifies its hazardous constituents. Copies of the Hazardous Waste Manifests are kept by the generator (in this case BRC), the transportation company, the disposal facility, and (in California) the state. Thus, hazardous wastes can be tracked from "the cradle to the grave." For nonhazardous wastes, a Bill of Lading or a Nonhazardous Waste Manifest may be used. Copies of these documents are typically kept by the generator, the transportation company, and the disposal/recycling facility. However, there is no obligation to forward a copy to the state.

One local regulation that may affect how waste materials generated at the Facility are handled is the South Coast Air Quality Management District's (SCAQMD's) Rule 1166, which limits emissions of VOCs. According to the SCAQMD, VOC-impacted soil is a soil that registers 50 parts per million (ppm) or greater of VOCs when measured by an organic vapor analyzer (OVA) at a distance of up to 3 inches from the soil surface. Rule 1166 requires the following:

1. The owner or operator must notify the SCAQMD Executive Officer by phone at least 24 hours prior to an excavation likely to involve VOC-containing soil, monitor the excavated material for VOCs, and cease excavation and cover the impacted soil if impacts are detected. The notification shall include the name of the owner or operator, location of the facility, location of the excavation, and the start/expected completion dates of the excavation.

2. A person treating or handling VOC-impacted soil must notify the Executive Officer by telephone within 24 hours of detection of VOC-impacted soil and implement soil mitigation measures approved by the Executive Officer using Best Available Control Technology.

3. A person shall not engage in or allow any spreading of VOC-impacted soil that results in uncontrolled evaporation of VOCs to the atmosphere.

Exemptions to provisions 1 and 2 include emergency soil decontamination or excavation performed pursuant to the requirements of an authorized agency officer. Exemptions to provisions 2 and 3 include treatment of less than 1 cubic yard of impacted soil, decontamination of soil containing organic compounds with initial boiling points of 302°F or greater, removal of soil for sampling purposes, accidental spillage of 5 gallons or less of VOCs, decontamination of soil impacted by natural sources, and decontamination of soil containing organic compounds with a Reid vapor pressure less than 80 millimeters of mercury (mmHg) or an absolute vapor pressure less than 36 mmHg.

1.5 EXISTING BRC POLICIES AND PROCEDURES

BRC has two policies pertaining to hazardous wastes and the handling of potentially impacted soils. Technical Information Series Volume 34, entitled "Complying with Hazardous Waste Regulations," addresses hazardous wastes, and Environmental Procedure DAC-062-043 pertains to the characterization and handling of potentially impacted soil. Copies of these policies are included as Appendix B of this SWMP. This SWMP is intended to be consistent with BRC's written policies.

SECTION 2
MANAGEMENT PROCEDURES

This section outlines procedures for segregating, containerizing, labeling, and handling soil and/or other IDW within the Facility and for profiling and manifesting these materials prior to offsite transportation and disposal/recycling. A flowchart showing the overall process for handling wastes generated during the site investigation is presented in Figure 3. Typical waste quantities of soil IDW generated during soil investigation activities are summarized in Table 1. A matrix of waste quantities, containers, and approximate disposal/treatment costs is presented in Table 2.

2.1 CONTAINERS AND LABELS

Potentially impacted soil and/or other IDW must be placed in appropriate containers. Appropriate containers include, but are not necessarily limited to, the following:

- 55-gallon (7.3 cubic feet) United Nations/Department of Transportation (UN/DOT)-approved, 17H-type steel drums with lids
- 8-cubic yard roll-off bins with open or sliding tops
- 20-cubic-yard roll-off bins with open or sliding tops
- 12-cubic yard low-sided roll-off bins with open tops
- 4,000- or 6,000-gallon polyethylene "poly tanks" with closed tops
- 500-barrel (21,000-gallon) steel "Baker tanks" or "Frac tanks"

These containers will be provided by BRC through one or more of its contractors. Environmental consultants/contractors involved in the Phase II soil investigation and remediation are not allowed to bring waste containers onsite.

Requests for containers should be made in advance by contacting BRC's hazardous waste contractor.

A Waste Container Request form should be used to request containers. A blank Waste Container Request form is included in Appendix C of this SWMP.

Estimates of the numbers of containers will be based on the numbers, depths, and diameters of the borings to be drilled, subject to the segregation requirements outlined in

Section 2.3. Larger containers and large quantities of drums require a minimum of 24 hours notice and can be delivered directly to the point of use.

Requests for waste container labels should be made concurrently with the requests for containers. These labels will be sequentially numbered and preprinted, to the extent possible, based on information provided by the requestor. Examples of preprinted information may include the type of waste (soil, water, PPE, etc.), the generating process (drilling, equipment decontamination, etc.), the approximate location of waste generation (building and column numbers), special handling requirements, and the type of chemical analysis required, if any. Unless specific information is available in advance, the preprinted labels will typically contain the heading "PENDING ANALYSIS," indicating that the waste material has not yet been classified as hazardous or nonhazardous. An example of a partially completed "Pending Analysis" label is included in Appendix C of this SWMP.

2.2 Concrete and Asphalt Cores

Most, if not all, of the buildings at the Facility feature concrete floor slabs, and most of the exterior areas are paved with concrete or asphalt. These floor slabs and paving materials will typically be cored or saw-cut to facilitate access to the underlying soil for subsurface investigation purposes. The resulting cores and pieces of saw-cut pavement are considered nonhazardous construction debris unless there are indications otherwise. Examples of such indications could include obvious stains, saturation by solvents or petroleum-based fuels, or stains from polychlorinated biphenyl (PCB)-containing oil.

Cores and pieces of saw-cut pavement to be managed as construction debris will be transported by the consultant/contractor and placed in a low-sided roll-off bin. These bins may be moved closer to the work area to minimize traffic and travel costs. Cores and pavement sections from any area of the Facility may be consolidated in this container. There are no labeling requirements for the environmental consultant; however, a record will be kept of which cores (or group of cores) were placed in each container.

BRC or BRC's contractors will be responsible for preparing the necessary paperwork for construction debris to be transported off the site for disposal or recycling. Currently used BRC-approved disposal/recycling facilities for nonhazardous construction debris are listed in Table 3.

2.3 DRILL CUTTINGS AND OTHER SOIL IDW

Most of the subsurface investigation techniques to be used in the site investigation will result in soil being brought to the ground surface. Common examples are borings drilled using hollow-stem auger techniques. Even direct push-type borings will generate soil, if only by way of discarded samples. Other processes that may generate relatively small quantities of soil are removal actions that occur once the Facility demolition phase is complete.

Soil generated by any of the processes listed above will be placed in 55-gallon drums or roll-off bins, depending on the volume generated (Table 1). Roll-off bins must not be filled to the top or they will be too heavy to pick up and transport. Specific weight limitations are as follows:

Roll-off Bin Capacity	Weight Limitation	Depth of Fill in Container*
8 cubic yards	18,000 pounds	1.75 feet
20 cubic yards	18,000 pounds	3.5 feet

* Note that the depth of fill is a calculated value based on a bulk density of 120 pounds per cubic foot (lb/ft^3) and an assumed bulking factor of 1.5.

Soil from more than one source may be consolidated within a single container (drum or roll-off bin), provided that all of the sources are within the same EIA and the anticipated chemical impacts are similar. Broad contaminant groups for the purposes of waste soil segregation are:

- Metals Cr(VI)
- VOCs
- POLs
- PCBs

For waste profiling purposes (Section 2.6), records will be kept on the contents of every waste container. These records will include the sequential label number, container type, the boring/well/sample station number, EIA, area of concern (AOC) number, and building number. A Waste Container Contents Log form will be used to maintain these records. A blank Waste Container Contents Log form is included in Appendix C of this SWMP.

When containers are full or partially full, the sequentially numbered labels will be securely attached by the contractor filling the container. If the outside of the drum is soiled, it will be cleaned prior to attaching the label. For added security, clear adhesive tape should be placed over the label and the label number written on the white drum lid. A second copy of the label should be placed in a plastic bag, sealed, affixed to the underside of the drum lid, and sealed inside the drum. When the drum is filled, the lid will be attached and secured using the bolt ring device. For roll-off bins, the lid should be slid into place to cover the soil at the end of each workday.

Container pickup will be requested from BRC (same contact as for container request) as necessary and appropriate. BRC's contractor(s) will typically relocate the containers to a central staging area pending profiling and offsite transportation for disposal or recycling.

2.4 EQUIPMENT DECONTAMINATION WATER

To minimize the likelihood of cross-contamination, equipment used in the Phase II soil investigation and in related postdemolition activities will be decontaminated frequently. Decontamination procedures may include steam cleaning or detergent wash/rinse cycles. The quantities of decontamination water generated will typically be contained in 55-gallon drums.

As with the drill cuttings (Section 2.3), equipment decontamination water may be consolidated by EIA but should be segregated based on the following broad contaminant groups:

- Metals, including Cr(VI)
- VOCs and POLs
- PCBs

The contents of each container will be documented in terms of the sequential container number, the boring/well/sample number, EIA, AOC, and building number (see Waste Container Contents Log form in Appendix C). Labels will be filled out and attached in a similar manner as for the drill cuttings, and container pickup procedures are also the same. BRC typically considers equipment decontamination water to be hazardous waste, regardless of how or where it is generated, and disposes of it accordingly.

2.5 USED PERSONAL PROTECTIVE EQUIPMENT

PPE will be worn by Ogden's employees and subcontractors to protect against exposure to potentially hazardous chemicals during the Phase II soil investigation and related postdemolition activities. Used PPE will be discarded at the end of each day and will generally include Tyvek® coveralls, disposable inner gloves, disposable boot covers, and/or used respirator cartridges.

BRC typically considers used PPE to be nonhazardous but, nevertheless, requires it to be placed in 55-gallon drums. PPE may be consolidated without restriction (i.e., PPE from different EIAs may be consolidated in a single container). Container labeling, content records, and pickup procedures are the same as for drill cuttings.

2.6 WASTE PROFILING

Waste profiling is the process by which BRC determines whether a waste is hazardous or nonhazardous and where it can be disposed of or recycled. Waste profiling will be BRC's responsibility, not the responsibility of the consultant or contractor that generated the waste.

To the extent possible, BRC prefers to profile wastes based on analytical results for soil or water samples collected during the waste generation, thus avoiding the need to open waste container(s) to sample and analyze the waste. For example, if a 55-gallon drum contained drill cuttings from 12 hand-augered borings in a certain EIA, the waste would be profiled based on analytical results for soil samples collected from those borings. This process enables average chemical concentrations to be used to profile the waste and can be more representative than collecting a grab sample of the waste itself. The ability to use this method of waste profiling, however, is dependent on knowing the contents of each container; hence, the importance of the Waste Container Contents Log form (Appendix C).

Nonetheless, containerized waste may require direct sampling for profiling or other purposes. This requirement may arise if a container is filled with waste for which there are no associated sample analyses or if data provided to BRC are inadequate for profiling. BRC's environmental department will direct Ogden or another contractor to sample containerized waste; however, the following is recommended as a minimum procedure:

- For 55-gallon drums, collect a single discrete soil sample from at or near the centroid of the drum.

- For 8-cubic-yard roll-off bins, collect two discrete soil samples from at or near the centroids of each half of the bin.

- For 20-cubic-yard roll-off bins, collect four discrete soil samples from at or near the centroids of each of four roughly equal quadrants of the bin.

Undisturbed soil samples collected using hand-augering or similar equipment are preferred. Samples should not be collected from depths of less than 12 inches from the exposed surface of the waste. With BRC's concurrence, the discrete samples may be combined by equal volume into a single composite sample per waste container, provided VOCs are not a potential contaminant. The composite samples should be analyzed for the compounds considered likely to be present in accordance with the analytical methods listed in Table 4.

It is noted that if BRC classifies a waste as hazardous, the 90-day storage time will begin at the time of generation.

2.7 WASTE TRANSPORTATION AND DISPOSAL/RECYCLING

BRC will be responsible for arranging and coordinating the offsite transportation and disposal/recycling of wastes generated during the Phase II soil investigation and the related postdemolition activities. This section, therefore, is for information purposes only.

Waste manifests, whether hazardous or nonhazardous, will be completed by BRC or its subcontractor(s) and signed by an authorized BRC employee. Under no circumstances should any Ogden employee or Ogden subcontractor employee sign any hazardous or nonhazardous waste manifests. Transportation services will typically be provided by a BRC contractor. Wastes will only be transported to a BRC-approved disposal/ recycling facility. A list of current BRC-approved facilities is presented in Table 3.

SECTION 3
REMEDIATION-DERIVED WASTE MANAGEMENT PROCEDURES

This section outlines procedures for segregating and handling larger quantities of soil that may be generated during the site investigation and, more likely, during the related postdemolition activities (for postdemolition soil monitoring protocol, please refer to Appendix D). Figure 3 illustrates the waste generation and disposal/ treatment process in a flowchart. A matrix of waste quantities and approximate disposal/treatment costs is presented in Table 2. In the context of this SWMP, the term "large" refers to quantities of soil greater than 10 cubic yards, which cannot be handled efficiently using 55-gallon drums or roll-off bins. This section specifically pertains to larger quantities of IDW, such as cuttings and/or drill mud from large-diameter well borings and localized near-surface soil removal actions. The types of hazardous constituents are expected to be the same as discussed in Section 2.0, but quantities of soil are expected to be significantly larger.

3.1 SCAQMD RULE 1166 CONSIDERATIONS

SCAQMD Rule 1166 limits the emission of VOCs from impacted soils and must be considered and, if necessary, addressed prior to excavations to remove or otherwise remediate VOC-containing soil. The following procedure is recommended:

- Evaluate the results of the AOC-specific or other investigations to determine whether VOCs are likely to be present in excavated soil, even if the excavation is targeted to remove metals or other nonvolatile organic compounds. If VOCs are potentially present, proceed as described below.

- Use professional judgment to decide whether vapor suppression measures are likely to be required and plan accordingly. Vapor suppression measures could include spraying with water, spraying with foam, or simply covering with polyethylene sheeting.

- Notify SCAQMD by phone at (909) 396-2326 at least 24 hours prior to commencing the excavation. The notification information must include the facility owner, facility location, and the estimated start and finish dates. The information must also be faxed to SCAQMD at (909) 396-3342. SCAQMD may send an inspector to monitor some or all of the excavation activities.

- Monitor organic vapor concentrations in the breathing zone during the excavation, near the face of the excavation, and near the surface of any soil stockpiles. SCAQMD considers a measurement of 50 ppm or more of organic vapors at 3 inches from an excavation or stockpile surface to indicate VOC-impacted soil, thus triggering the requirement for vapor suppression measures. The OVA must be properly calibrated and the appropriate correction factor (if any) must be applied for the target VOC. The OVA readings, the times they were recorded, and the approximate reading locations will be documented.

- Employ vapor suppression methods as appropriate. The simplest methods are spraying the excavation and the excavated soil with water and/or covering excavated soil with 6-mil polyethylene sheeting. If polyethylene covers are used, they must be adequately weighted down with sandbags, old tires, etc.

- Rule 1166-required notifications will be made by the soil removal contractor.

3.2 Stockpile Considerations

It is likely that impacted soil will be temporarily stockpiled during the anticipated postdemolition, near-surface soil remediation program. Procedures for stockpiling soil will vary depending on the location and size of the excavation, the chemicals present, and the length of time the stockpile is likely to be temporarily stored. The following procedure is recommended as general guidance:

- Estimate stockpile quantities prior to excavation activities. Identify the chemicals of concern, the ultimate disposition of the stockpiled soil, and the length of time the stockpile is likely to be temporarily stored onsite.

- Discuss stockpile locations with BRC personnel (Scott Lattimore), mark the agreed upon location on a scaled site plan, and have the plan signed by an authorized BRC representative.

- For soil that will be stockpiled for 1 to 2 weeks and when no precipitation is likely, the soil may be stockpiled directly onto an asphalt- or (preferably) concrete-paved surface. The stockpile area will be delineated with wooden barriers, traffic control cones or bollards, caution tape, or similar methods. The stockpile should be covered as necessary to comply with SCAQMD Rule 1166.

- For soil that will be stockpiled for longer periods of time or when precipitation is likely, additional measures should include encircling the stockpile with a berm of straw bales or a manufactured berm material to minimize runon or runoff. In addition, the stockpile should be covered with polyethylene sheeting whether or not the soil contains VOCs. The stockpile cover should be anchored to the berm such that direct precipitation runs off freely and is not impounded.

To the extent possible, the characterization of stockpiled waste will be based on the analysis of soil samples collected during the site investigation, i.e., prior to creating the stockpile. It is possible, however, that additional sampling and analysis may be required for profiling or other purposes. In the event that a soil stockpile must be sampled, the following procedure is recommended as a minimum standard:

- Collect a minimum of four discrete soil samples from stockpiles for the first 100 cubic yards of soil.

- Collect one additional soil sample per 100 cubic yards of stockpiled material between 100 and 1,000 cubic yards of soil.

- Collect one additional soil sample per 500 cubic yards of stockpiled material over 1,000 cubic yards.

Because stockpile geometry may vary considerably, professional judgment should be used in selecting discrete sampling locations with the objective of generating representative analytical data. Where possible, stockpiles should be divided into the appropriate number of sections or quadrants and samples collected from at or near the centroid of each quadrant. Undisturbed samples collected using hand-augering or similar equipment are preferred. Samples should not be collected from depths less than 18 inches from the exposed surface of the stockpile. Discrete samples should not be composited but, rather, should be analyzed for the compounds considered likely to be present in accordance with the analytical methods listed in Table 4.

3.3 CONCRETE/ASPHALT PAVING AND FOUNDATION SLABS

BRC anticipates that site investigations will identify localized areas of soil that must be removed or otherwise remediated prior to redevelopment. As a precursor to removal of these soils, the overlying concrete or asphalt paving will likely be saw-cut and removed. If the impacted soil is located beneath a building, the building's floor slab will also likely need to be saw-cut, broken, and removed. These activities could result in volumes of broken pavement and concrete that cannot be cost-effectively handled using the low-sided roll-off bins also used for smaller quantities (Section 2.2).

Prior to any activities likely to generate large quantities of asphalt or concrete, the volume and weight should be estimated based on the area to be disturbed. The findings of any site investigation (or other) in the area to be disturbed should be reviewed with BRC so that the nonhazardous classification of the asphalt and concrete can be supported. Two primary methods of handling large quantities of nonhazardous construction debris are envisioned:

1. Direct load and transport offsite for recycling
2. Stockpile onsite for onsite recycling or subsequent transport offsite

3.3.1 Direct Load with Offsite Transportation

Under this option, transportation in one or more end-dump trucks would be prearranged by or on behalf of BRC, as would acceptance at one or more approved recycling facilities. The asphalt and concrete would be broken in place and loaded directly onto trucks, thus avoiding "double handling." After completing the Bill of Lading documentation, the trucks would transport the material directly to an offsite crushing/recycling facility.

3.3.2 Stockpiling for Onsite Use or Offsite Transportation

Under this option, nonhazardous construction debris would be stockpiled in a predesignated location for onsite crushing/recycling and reuse or for later offsite transportation. Onsite crushing/recycling may be more cost-effective than the comparable offsite process because transportation is minimized and the recycled material has economic value as road base or other engineered fill and could be used during redevelopment. Given the size of the paved areas at the Facility, it is probable that the demolition contractor may already have the necessary equipment onsite. Onsite stockpile and crushing locations would be approved in advance by BRC and would ideally be close enough to the generating location to avoid transloading. If transloading cannot be avoided, a direct load-and-haul procedure similar to that described in Section 3.3.1 is envisioned.

If onsite crushing is not possible or desirable (e.g., due to dust), construction debris could be stockpiled temporarily prior to transportation offsite. Again, temporary stockpile locations would be preapproved by BRC. Ideally, they would be located adjacent to the generating location to avoid unnecessary transportation.

3.4 Equipment Decontamination and Well Development Water

If large quantities of equipment decontamination and well development water are generated, containerization in 55-gallon drums and offsite disposal as hazardous waste may become cost-prohibitive. Two primary methods of handling large quantities of potentially impacted water are envisioned:

1. Consolidation into large tanks for bulk offsite disposal or treatment
2. Onsite treatment and discharge

3.4.1 Bulk Offsite Disposal/Treatment

Under this option, equipment decontamination water and well development/purge water would be transferred into one or more large tanks, probably 500-barrel Baker tanks or Frac tanks. Depending on the ultimate disposition, some segregation of waste streams may be prudent according to expected metal (especially Cr [VI]) and organic chemical content. Once a sufficient volume has been accumulated and sediments have been given time to settle out, clear water could be drawn or pumped from the top of the tank using a vacuum truck or similar equipment. The clear water could then be transported and treated at a suitable offsite facility without incurring the usually high surcharges for turbid or sediment-laden water, which require pretreatment. An allowance should be made for cleaning out the holding tank(s) at the end of the project and disposing of the accumulated sediment.

3.5 AQUIFER PUMPING TEST WATER

Pumping tests to estimate aquifer parameters often generate quantities of water too large to containerize and treat on a batch basis. Alternatives for handling pumping test water include, but are not necessarily limited to, direct discharge to the sanitary sewer system or treatment and direct discharge to the sanitary sewer or storm drain system.

The direct discharge of untreated groundwater to the sanitary/industrial sewer system may be possible, depending on the flow rate, the types and estimated concentrations of potentially hazardous constituents, and BRC's sewer discharge permit limitations. If permit conditions allow, this option would entail running a temporary polyvinyl chloride (PVC) pipeline from the extraction well to the nearest suitable inlet to the sewer.

If the discharge permit does not allow the discharge of groundwater into the sewer system, follow the procedure described in Section 3.4.1.

3.6 LARGE QUANTITIES OF SOIL

As discussed earlier in this SWMP, relatively large quantities of soil may be generated during postdemolition removal actions. Soils containing VOCs may be subject to SCAQMD's Rule 1166, which precludes aeration/volatilization as a remediation option. Absent this option, potentially viable alternatives for handling relatively large quantities of soil include, but are not limited to, the following:

1. Onsite treatment
2. Bulk offsite disposal/recycling

The selection of either of these alternatives, and the appropriate process options for onsite treatment, will be on a case-by-case basis. The following descriptions are for conceptual, illustrative purposes only.

3.6.1 Onsite Treatment Options

Several options are available for the onsite treatment of impacted soil. These include low temperature thermal oxidation (LTTO), *ex situ* vapor extraction, and *ex situ* bioremediation.

LTTO would be appropriate for soil containing aromatic VOCs, aviation fuels, and other POLs. LTTO could also be used for soil containing chlorinated VOCs if the equipment incorporates appropriate off-gas treatment. SCAQMD-permitted, transportable LTTO systems are available from several vendors in the Los Angeles area. A typical arrangement includes onsite vendor assembly and operation of the LTTO system on a per-cubic-yard rate. However, a minimum of 5,000 cubic yards is typically required to make LTTO cost-effective. The impacted soil is typically loaded onto a conveyor that passes through a heated chamber, raising the temperature of the soil and driving off the organic chemicals. Dried soil is the end product. Cohesive soils, such as those expected to be encountered at the Facility, may require preprocessing to achieve a suitable size for efficient treatment. Moreover, dried cohesive soils require moisture conditioning prior to recompaction.

Ex situ vapor extraction would be appropriate for soil containing aromatic and/or chlorinated VOCs. A typical application involves arranging the impacted soil in a "windrow," which contains an array of perforated PVC pipes. When the windrow is complete, it is covered with polyethylene sheeting (typically 6-mil) to minimize volatilization to ambient air, which could violate SCAQMD's Rule 1166. Negative pressure is created inside the covered windrow using a blower or vacuum pump manifolded to the array of perforated PVC pipes. Negative pressure accelerates volatilization of VOCs from the soil matrix and removes them from the windrow via the blower. Off-gas treatment is required for the exhaust from the blower. The most common off-gas treatment option is vapor-phase granular activated carbon (VGAC). This type of *ex situ* vapor extraction system will require a permit from SCAQMD.

Ex situ bioremediation would be appropriate for soil containing aromatic VOCs, aviation fuels, and other POLs. Most processes involve the addition of water and nutrients to the impacted soil to stimulate naturally occurring bacteria in the soil. Other processes involve the addition of bacteria or enzymes, in addition to moisture and nutrients, to accelerate the naturally occurring bioremediation process. The addition of water and nutrients can take place in a land farming application, where the soil is spread out over a paved area and periodically sprayed and turned over. Because of the requirement for large areas of open space for the land farming process, however, an increasingly common method is to use a processing unit. These units are similar in concept to the LTTO described above except that instead of a heated chamber, the unit features mechanical agitators that mix the soil as the water and nutrients are added. The end process is a wetted soil that often must be dried before it can be used as backfill.

3.6.2 Bulk Offsite Disposal/Recycling

This option would be suitable for soil containing any of the chemicals likely to be encountered at the Facility. Logistically, it would be similar to the bulk disposal of nonhazardous construction debris described in Section 3.3. Quantities would be estimated in advance and arrangements for transportation and acceptance at a suitable disposal/recycling facility made in advance. Arrangements for acceptance could be based on a review of individual AOC investigation findings in the disturbed area. Current BRC-approved disposal/recycling facilities are listed in Table 3. Ideally, the soil would be direct-loaded into end-dump trucks to avoid double handling. If direct-loading is not possible, the soil could be temporarily stockpiled at one or more BRC-approved locations.